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| APPLICATION NO.   | FILING DATE   | FIRST NAMED INVENTOR    | ATTORNEY DOCKET NO. | CONFIRMATION NO. |          |              |      |  |           |               |            |       |
|---|---------------|-------------------------|---------------------|------------------|----------|--------------|------|--|-----------|---------------|------------|-------|
| 10/566,595  | 06/12/2006    | Djamschid Amirzadeh-Asl | NY-DNAG-315-US      | 5773             |          |              |      |  |           |               |            |       |
| <div>24972      7590      10/16/2007<br/>FULBRIGHT &amp; JAWORSKI, LLP<br/>666 FIFTH AVE<br/>NEW YORK, NY 10103-3198</div> <div>EXAMINER<br/>HEVEY, JOHN A</div> <table border="1"><thead><tr><th>ART UNIT</th><th>PAPER NUMBER</th></tr></thead><tbody><tr><td>4116</td><td></td></tr></tbody></table> <table border="1"><thead><tr><th>MAIL DATE</th><th>DELIVERY MODE</th></tr></thead><tbody><tr><td>10/16/2007</td><td>PAPER</td></tr></tbody></table> |               |                         |                     |                  | ART UNIT | PAPER NUMBER | 4116 |  | MAIL DATE | DELIVERY MODE | 10/16/2007 | PAPER |
| ART UNIT  | PAPER NUMBER  |                         |                     |                  |          |              |      |  |           |               |            |       |
| 4116  |               |                         |                     |                  |          |              |      |  |           |               |            |       |
| MAIL DATE   | DELIVERY MODE |                         |                     |                  |          |              |      |  |           |               |            |       |
| 10/16/2007  | PAPER         |                         |                     |                  |          |              |      |  |           |               |            |       |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

### Application No.

10/566,595

### Applicant(s)

AMIRZADEH-ASL, DJAMSCHID

### Examiner

John A. Hevey

### Art Unit

4116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

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## **DETAILED ACTION**

### ***Status of Application***

1. Claims 8-31 are pending and presented for examination. Claims 1-7 are cancelled.

### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/EP0408837, filed on 8/14/2004.

### ***Information Disclosure Statement (IDS)***

3. The information disclosure statement (IDS) was submitted on 1/31/2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner. Please refer to applicants' copy of the 1449 submitted herewith.

### ***Claim Objections***

4. Claim 22 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 22 requires 0-15% CaO as a main ingredient, however, claim 12 which it is dependent upon, requires 0.5-15% CaO. Because the dependent claim requires a broader range, it fails to further limit the subject matter of the previous claim.

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5. Claim 28 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 14. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

6. Claim 29 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 29 is dependent on claim 15 which requires TiO<sub>2</sub> residues be used in a tap hole mass. However, claim 29 requires where TiO<sub>2</sub> residues are injected into a metallurgical furnace. As a tap hole mass is part of a furnace, claim 29 is redundant and sets forth a broader limitation than the previous claim, and thus fails to further limit the subject matter of claim 14.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 8-11, 14-15, 23-25, and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amirzadeh-Asl et al. (EP0611740) in view of Auer et al. (DE19725021).

In regards to claims 8-11, the instant claims are drawn to a method of subjecting TiO<sub>2</sub> residue to a heat treatment and performing a metallurgical process or preparing a refractory material with the TiO<sub>2</sub> material. Amirzadeh-Asl et al. teaches the use of TiO<sub>2</sub> residue in the form of powder or molded bodies as a refractory material for improving the durability furnace walls after undergoing a heat treatment at 1000 C (see examples 1-3 of Amirzadeh-Asl). The prior art differs from the instant claim in that TiO<sub>2</sub> residue is not specifically from a sulfate process, and that additional residues (coal or iron) are added to the material before heating.

However, it would have been obvious to one of ordinary skill in the art to apply the method of Amirzadeh-Asl to the TiO<sub>2</sub> residue from a sulfate process as taught by Auer et al. The process is drawn to the reuse of TiO<sub>2</sub> residue; therefore it would be obvious to one of ordinary skill to apply this method to TiO<sub>2</sub>

residue formed by any process, such as that of Auer. It would have also been obvious to one of ordinary skill in the art to use solely TiO<sub>2</sub> residue to prepare a refractory material. One would have been motivated to make such changes to simplify the process (less materials needed), and to increase the refractoriness of the resultant product (see Auer translation page 4).

In regards to claims 14-15, 23-25 and 31, Amirzadeh-Asl teaches where the heat treated TiO<sub>2</sub> residue is charged into a furnace in order to increase the durability of the refractory lining (see rejection above). Amirzadeh-Asl also teaches where the heat-treated TiO<sub>2</sub> residue is used to form cylindrical molded products, which could be used for a tap hole (see example 1 of Amirzadeh-Asl).

In regards to claim 24, the instant claim is drawn to the use of heat treated TiO<sub>2</sub> in a metallurgical process. Amirzadeh-Asl teaches the use of the material to improve furnace walls (see above), which is considered a metallurgical process, as no further description of the requirement is given in the instant claims or specification.

10. Claims 12-13 and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amirzadeh-Asl et al. (EP0611740) in view of Auer et al. (DE19725021) as applied to claims 8-11 above, and further in view of Pierce et al. (US2476453).

In regards to claims 12 and 16-18, the instant invention requires that the TiO<sub>2</sub> residue comprises 35-70% TiO<sub>2</sub>, 5-40% SiO<sub>2</sub>, 2-15% Fe compounds, 1-15% MgO, and 0.5-15% CaO. Amirzadeh-Asl teaches the use of TiO<sub>2</sub> residues

but differs in that it does not disclose this particular composition. However, it would have been obvious to one of ordinary skill in the art to use any TiO<sub>2</sub> residue composition that is known to be a good refractory material. Pierce et al. teaches refractory TiO<sub>2</sub> slag compositions comprising for example, 70% TiO<sub>2</sub>, 6.35% FeO, 10.95% CaO, 4.22% MgO, and 4.97% SiO<sub>2</sub> (see column 7, lines 30-75). One would have been motivated to make such a modification in order to decrease cost and preserve the environment, by reutilizing leftover material (See Amirzadeh-Asl DE).

In regards to claims 13 and 19-22, the instant invention requires that the TiO<sub>2</sub> residue comprises 20-80% TiO<sub>2</sub>, 2-30% SiO<sub>2</sub>, 0-15% Al<sub>2</sub>O<sub>3</sub>, 0-15% Fe compounds, 1-15% MgO, and 0-15% CaO. Amirzadeh-Asl teaches the use of TiO<sub>2</sub> residues but differs in that it does not disclose this particular composition. However, it would have been obvious to one of ordinary skill in the art to use any TiO<sub>2</sub> residue composition that is known to be a good refractory material. Pierce et al. teaches refractory TiO<sub>2</sub> slag compositions comprising for example, 70% TiO<sub>2</sub>, 6.35% FeO, 10.95% CaO, 4.22% MgO, and 4.97% SiO<sub>2</sub> (see column 7, lines 30-75). It is assumed if converted these values calculated as oxides, would not differ significantly, and therefore read on the instant claims. One would have been motivated to make such a modification in order to decrease cost and preserve the environment, by reutilizing leftover material (See Amirzadeh-Asl).

In regards to claims 26-29, Amirzadeh-Asl teaches where the heat-treated TiO<sub>2</sub> residue is charged into a furnace in order to increase the durability of the refractory lining (see rejection of claim 14 above).

### ***Conclusion***

11. All pending claims have been rejected.
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Hevey whose telephone number is 571-270-3594. The examiner can normally be reached on Monday - Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-270-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

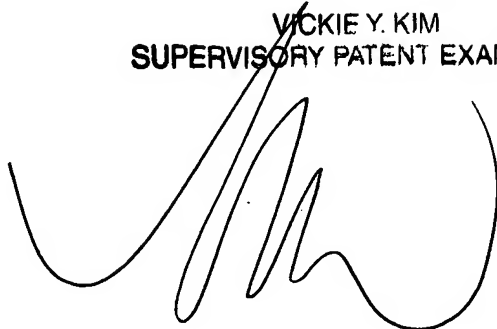
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VICKIE Y. KIM  
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to be 'VYK', written over the printed name and title.